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PHARMA HIGHLIGHTS

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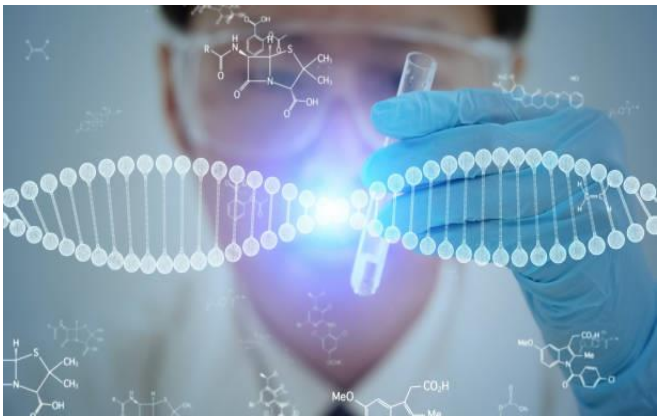
Prospects of Regenerative Medicine



Stem cells are a population of undifferentiated cells characterized by the ability to extensively proliferate (self-renewal), usually arise from a single cell (clonal), and differentiate into different types of cells and tissue (potent). There are several sources of stem cells with varying potencies. Pluripotent cells are embryonic stem cells derived from the inner cell mass of the embryo and induced pluripotent cells are formed following reprogramming of somatic cells. Pluripotent cells can differentiate into tissue from all 3 germ layers (endoderm, mesoderm, and ectoderm). Multipotent stem cells may differentiate into tissue derived from a single germ layer such as mesenchymal stem cells which form adipose tissue, bone, and cartilage. Tissue-resident stem cells are oligopotent since they can form terminally differentiated cells of a specific tissue. Stem cells are an important tool for understanding both the organogenesis and the continuous regenerative capacity of the body. Stem cells, thus, can be used in cellular therapy to replace damaged cells or to regenerate organs. In addition, stem cells have expanded our understanding of development as well as the pathogenesis of disease. They could be a model for the study of pathogenetic mechanisms and could assist researchers in understanding the pathophysiology of various diseases. They also offer the possibility of developing biological models for the study of new pharmacological agents. For instance, disease-specific cell lines can be propagated and used in drug development.

To date, many research protocols, preclinical studies, and clinical trials have been published. Although, several clinical studies have already reported encouraging results for the development of new therapeutic strategies in cell-based medicine, there are a number of risks and obstacles. Currently, the only stem cell products that are FDA-approved for use in the United States consist of blood-forming stem cells (also known as hematopoietic progenitor cells) that are derived from umbilical cord blood. These products are approved for use in patients with disorders that affect the production of blood (i.e., the “hematopoietic” system) but they are not approved for other uses. However, ongoing research and development gives us great optimism about regenerative medicine.

Written by: Rabeya Mollika (Teaching Assistant)

Role of Nutrients in the Prevention of NCDs

NCDs which is known as Non-Communicable Disease is an acute infection which needs long term treatment and care. Diseases like cancer, cardiovascular disease, diabetes and chronic lung illness fall under NCDs. NDCs is responsible for killing 41 million people every year which consists of 71% of all deaths globally. The risk factors of NCDs includes raised blood pressure, overweight/ obesity, hyperglycemia, hyperlipidemia etc.

It has been observed that vitamin D helps to maintain musculoskeletal health. Higher risk of hip fracture is found if 25 hydroxy vitamin D level lies below 5-62.5 nmol/ L. It is seen that 13% of Europeans suffer from vitamin D deficiency. So, the uptake of vitamin D is very important. Besides vitamin D, Vitamin K also helps in regulating osteoblast, transcription of regulating genes of osteoblasts So vitamin K supplements along with vitamin

D and calcium are taken. In cardiovascular disease also good nutrition plays a vital role. A diet rich in fruits, vegetables, nuts, and dietary products need to be

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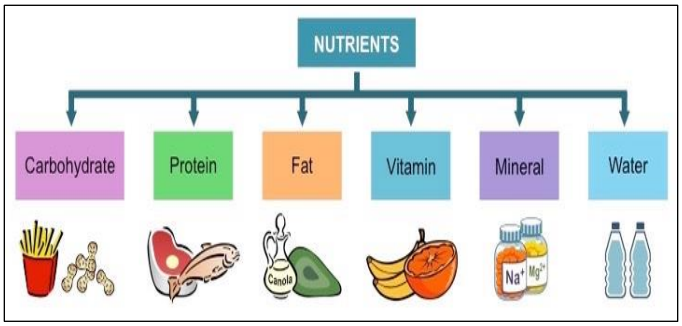
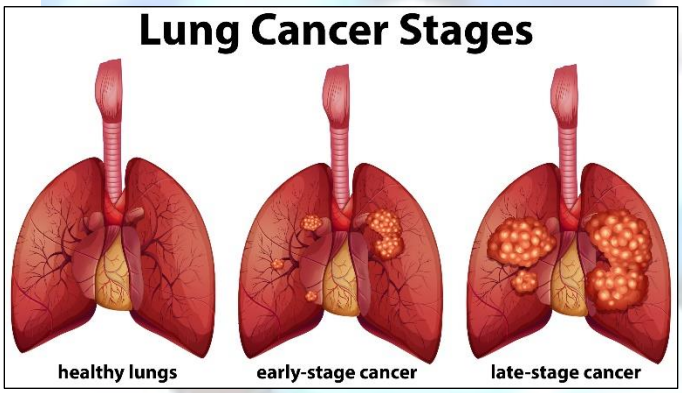
followed. Besides food with antioxidants, such as beta carotene associated with vitamin K lowers cardiovascular diseases. Excess amount of trans fat, cholesterol, sugar leads to adverse effects. According to the statistics of 2005, 30% of the people suffer from hypertension. In this case, vitamin C and D helps to reduce the systolic pressure reducing hypertension. Whereas, vitamin K has antioxidant properties which lowers the risk of hypertension. PAN American Health Organization (PAHO) are taking steps to prevent and to reduce risk and disabilities. PAHO is raising political and public awareness regarding the well-being of the population. Inadequate nutrient intake is common in the aging population which is a risk for developing of NCDs during aging.



Written by: Mahreen Islam Ima (ID: 20146054)

Lung Cancer Treatment: Specific Gene Mutation May Be a Key



Lung cancer can be both deadly and difficult to treat. Experts' understanding of lung cancer has significantly expanded in recent years with developing new treatment options being a priority. As options for specific, targeted treatments emerge, experts are hopeful that the prognosis for people with lung cancer will continue to improve. In a recent published in Nature, researchers report that targeting components of lipid metabolism and synthesis could lead to an effective lung cancer treatment. There are a few different types of lung cancer with distinct characteristics. The type of lung cancer someone has helped doctors determine treatment options and predict prognosis. One of the most common types of lung cancer is non-small cell lung cancer (NSCLC). Some people with lung cancer have a distinct gene mutation that occurs. Specifically, mutations in the KRAS gene can happen in people with lung cancer. As the American Lung Association notes, "About 20-25% of lung cancer patients have some kind of KRAS mutation." Researchers are still working to understand how KRAS gene mutations impact lung cancer and how to develop targeted treatment options. One area of interest is how the KRAS gene mutation affects fatty acid metabolism. Researchers in the recent study examined a few different components of lung cancer with the KRAS mutation. First, they said they found that lung cancer with the mutant KRAS gene had a unique lipid profile. They further reported that lung cancer with the KRAS gene mutation was dependent on a specific enzyme, FASN, that is involved in fatty acid synthesis. Researchers then worked to target this enzyme and its function. They reported that blocking FASN promoted the death of specific lung cancer cells. For example, FASN inhibitors contributed to Ferroptosis, a specific type of cell death. Ultimately, researchers hope that this data will promote the development of specific targeted lung cancer treatments.

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